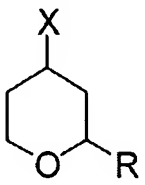
AMENDMENTS TO THE SPECIFICATION

The paragraph beginning on page 2, line 30, is being amended as follows:

The present invention also relates to a process for preparing the 4-aminotetrahydropyran compound or an acid salt thereof, which comprises

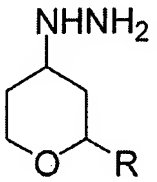
(A) the first step of reacting a ~~4-substituted tetrahydropyran~~ 4-substituted tetrahydropyran compound represented by the formula (3):



(3)

wherein R has the same meaning as defined above, and X represents a leaving group,

with a hydrazine to prepare a 4-hydrazinotetrahydropyran compound represented by the formula (2):

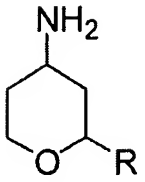


(2)

wherein R has the same meaning as defined above,

or an acid salt thereof,

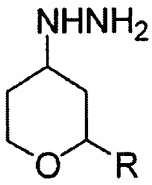
(B) then, the second step of decomposing the 4-hydrazinotetrahydropyran compound or an acid salt thereof in the reaction mixture in the presence of at least one compound selected from Raney nickel, a noble metal catalyst and a metal oxide to prepare a 4-aminotetrahydropyran compound represented by the formula (1):



(1)

wherein R has the same meaning as defined above.

The present invention also relates to a ~~2-substituted-4-hydrazinotetrahydropyran~~ 2-substituted 4-hydrazinotetrahydropyran compound represented by the above-mentioned formula (2):



(2)

wherein R has the same meaning as defined above,

or an acid salt thereof.

The paragraph beginning on page 8, line 18, is being amended as follows:

The first step of the present invention is a step of obtaining a reaction solution comprising a 4-hydrazinotetrahydropyran compound or an acid salt thereof as a main product by reacting the ~~4-substituted-tetrahydropyran~~ 4-substituted tetrahydropyran compound with a hydrazine.

The paragraph beginning on page 8, line 23, is being amended as follows:

The ~~4-substituted-tetrahydropyran~~ 4-substituted tetrahydropyran compound to be used in the first step of the present invention is represented by the above-mentioned formula (3). In the formula (3), R has the same meaning as defined above.

The paragraph beginning on page 9, line 6, is being amended as follows:

An amount of the hydrazine to be used in the first step of the present invention is preferably 1.0 to 20.0 mol, more preferably 4.0 to 15.0 mol based on 1 mol of the ~~4-substituted-tetrahydropyran~~ 4-substituted tetrahydropyran compound. Incidentally, the hydrazine may be used in any forms such as an anhydride (free hydrazine), a hydrate or an acid salt (including that the acid salt is neutralized with a base), or an aqueous solution, etc.

The paragraph beginning on page 9, line 29, is being amended as follows:

An amount of the above-mentioned solvent to be used is optionally controlled depending on a degree of uniformity or condition of stirring of the reaction solution, and is preferably 0.1 to 50 ml, more preferably 0.5 to 10 ml based on 1 g of the ~~4-substituted-tetrahydropyran~~ 4-substituted tetrahydropyran compound.

The paragraph beginning on page 9, line 34, is being amended as follows:

The first step of the present invention is carried out, for example, by the method in which the ~~4-substituted-tetrahydropyran~~ 4-substituted tetrahydropyran compound, a hydrazine and an organic solvent are mixed in an inert gas atmosphere, and reacted with stirring, etc. A reaction temperature at the time is preferably 20 to 120°C, more preferably 50 to 100°C, and a reaction pressure is not specifically limited. Also, a reaction time may be any time so long as the reaction has been completed and it is not specifically limited.

The paragraph beginning on page 10, line 18, is being amended as follows:

The 2-substituted tetrahydropyran-4-sulfonate to be used as the starting material in the above-mentioned first step of the present invention is represented by the above-mentioned formula (4). In the formula (4), R^1 is a hydrocarbon group, and as the hydrocarbon group, there may be mentioned the same hydrocarbon group of R in the above-mentioned formula (1), and there may be mentioned, for example, an alkyl group such as a methyl group, an ethyl group, a propyl group, a butyl group, a pentyl group, a hexyl group, etc.; a cycloalkyl group such as a cyclopropyl group, a cyclobutyl group, a cyclopentyl group, a cyclohexyl group, etc.; an aralkyl group such as a benzyl group, a phenethyl group, etc.; an aryl group such as a phenyl group, a tolyl group, a naphthyl group, an ~~anthranyl~~ anthryl group, etc. Incidentally, these groups include various kinds of isomers. In the present invention, of these, a methyl group, an ethyl group or a phenyl group is preferably mentioned as R^1.

The paragraph beginning on page 11, line 28, is being amended as follows:

The aldehyde compound, the polymer thereof or the acetal compound thereof to be used in the reaction of the present invention is represented by the above-mentioned formula (5). In the formula (5), R^1 has the same meaning as mentioned above. As such an aldehyde compound, there may be mentioned, for example, an alkyl aldehyde such as acetaldehyde, propionaldehyde, butylaldehyde, isobutyl aldehyde, valeraldehyde, isovaleraldehyde, etc., and an aryl aldehyde such as benzaldehyde, ~~o-tolylaldehyde, m-tolylaldehyde, p-tolylaldehyde~~ o-tolualdehyde, m-tolualdehyde, p-tolualdehyde, etc. Also, as the polymer of the above-mentioned aldehyde compound, there may be mentioned, for example, paraldehyde, metaldehyde, para-

propionaldehyde, etc., and as the acetal compound, there may be mentioned, for example, acetaldehyde dimethylacetal, acetaldehyde diethylacetal, etc.

The paragraph beginning on page 12, line 7, is being amended as follows:

An ~~amounts~~ amount of the above-mentioned aldehyde compound, the polymer thereof or the acetal compound thereof is, in terms of an amount of the aldehyde, preferably 1.0 to 5.0 mol, more preferably 1.1 to 2.0 mol based on 1 mol of the 3-buten-1-ol.

The heading on page 13, line 25, is being amended as follows:

~~Example 1~~ Reference example 1

The subheading on page 13, line 26, is being amended as follows:

~~(1)~~ Synthesis of 4-hydrazinotetrahydropyran

The paragraph beginning on page 13, line 27, is being amended as follows:

To a flask having an inner volume of ~~500~~ 1000 ml, made of glass and equipped with a stirring device, a thermometer and a reflux condenser were charged 134.7 g (710 mmol) of tetrahydropyranyl-4-methanesulfonate with a purity of 95%, 256 ml (5.27 mol) of hydrazine monohydrate and 256 ml of ethanol, and the mixture was reacted at 70 to 80°C for 3 hours under nitrogen atmosphere with stirring. After completion of the reaction, the reaction mixture was cooled to room temperature, 98 ml (784 mmol) of 8 mol/l aqueous sodium hydroxide solution was added to the mixture, and the resulting mixture was concentrated under reduced pressure.

After adding 500 ml of toluene to the concentrate, the mixture was filtered, and the filtrate was again concentrated under reduced pressure. Precipitated solid was removed by filtration to obtain 45.0 g (Isolation yield: 51%) of 4-hydrazinotetrahydropyran with a purity of 93% (areal percentage by gas chromatography) as yellowish liquid.

The following heading is being added to page 14, before line 15:

Example 1

The subheading on page 14, line 15, is being amended as follows:

~~(2)~~ Synthesis of 4-aminotetrahydropyran

The paragraph beginning on page 14, line 16, is being amended as follows:

To a flask having an inner volume of 30 ml, made of glass and equipped with a stirring device, a thermometer and a reflux condenser were charged 260 mg (2.08 mmol) of 4-hydrazinotetrahydropyran with a purity of 93% synthesized in the same manner as in the above-mentioned ~~(1)~~ Reference example 1, 92 mg of developed Raney nickel and 2.5 ml of ethanol, and the mixture was reacted at 75°C for 6 hours under hydrogen atmosphere. After completion of the reaction, the reaction mixture was cooled to room temperature and filtered, and the filtrate was analyzed (internal standard method) by gas chromatography, 136 mg (Reaction yield: 65%) of 4-aminotetrahydropyran was found to be formed.

The heading on page 14, line 28, is being amended as follows:

~~Example 2~~ Reference example 2

The subheading on page 14, line 29, is being amended as follows:

~~(1)~~ Synthesis of 4-hydrazinotetrahydropyran hydrochloride

The paragraph beginning on page 14, line 30, is being amended as follows:

To a flask having an inner volume of 200 ml, made of glass and equipped with a stirring device, a thermometer and a reflux condenser were charged 10.0 g ~~(50 mmol)~~ (53 mmol) of tetrahydropyranyl-4-methanesulfonate with a purity of 95%, 26 ml ~~(530 mmol)~~ (536 mmol) of hydrazine monohydrate and 26 ml of ethanol, and the mixture was reacted at 75°C for 3 hours under nitrogen atmosphere with stirring. After completion of the reaction, the reaction mixture was cooled to room temperature, 14 g (72.6 mmol) of 28% by weight sodium methoxide-methanol solution was added to the mixture, and the resulting mixture was concentrated under reduced pressure. After adding 50 ml of toluene to the concentrate, the mixture was filtered and the filtrate was again concentrated under reduced pressure. The concentrate was cooled to 0°C, 50 ml of methanol and 6.5 ml (78 mmol) of 12 mol/l hydrochloric acid were added thereto, and the mixture was concentrated under reduced pressure. The concentrate was recrystallized from ethanol and toluene to obtain 2.8 g (Isolation yield: 34%) of 4-hydrazinotetrahydropyran hydrochloride with a purity of 99% (areal percentage by gas chromatography) as colorless crystals.

The following heading is being added to page 15, before line 21:

Example 2

The subheading on page 15, line 21, is being amended as follows:

~~(2)~~ Synthesis of 4-aminotetrahydropyran hydrochloride

The paragraph beginning on page 15, line 22, is being amended as follows:

To a flask having an inner volume of 500 ml, made of glass and equipped with a stirring device, a thermometer and a reflux condenser were charged 60.0 g ~~(392 mmol)~~ (389 mmol) of 4-hydrazinotetrahydropyran hydrochloride with a purity of 99% and synthesized in the same manner as in the above-mentioned ~~(1)~~ Reference example 2, 12.0 g of a developed Raney nickel, 120 ml of ethanol and 120 ml of water, and the mixture was reacted at 75°C for 24 hours under hydrogen atmosphere. After completion of the reaction, the reaction mixture was cooled to room temperature and filtered, and the filtrate was concentrated under reduced pressure. Then, 200 ml of n-butyl alcohol and 50 ml (600 mmol) of 12 mol/l hydrochloric acid were added to the concentrate, and the mixture was concentrated under reduced pressure to obtain 38.5 g (Isolation yield: 70%) of 4-aminotetrahydropyran hydrochloride with a purity of 98% (areal percentage by gas chromatography) as white crystals.

The subheading on page 16, line 10, is being amended as follows:

Synthesis of 4-aminotetrahydropyran ~~hydrochloride~~

The paragraph beginning on page 16, line 11, is being amended as follows:

To a flask having an inner volume of 50 ml, made of glass and equipped with a stirring device, a thermometer and a reflux condenser were charged 1.0 g ~~(6.55 mmol)~~ (6.49 mmol) of 4-hydrazinotetrahydropyran hydrochloride with a purity of 99% and synthesized in the same manner as in ~~Example 2(2)~~ Reference Example 2, 200 mg of developed Raney nickel and 5 ml of ethanol, and the mixture was reacted at 75°C for 20 hours under argon atmosphere. After completion of the reaction, the reaction mixture was cooled to room temperature and filtered, and when the filtrate was analyzed (internal standard method) by gas chromatography, 246 mg (Reaction yield: 37%) of 4-aminotetrahydropyran was found to be formed.

The paragraph beginning on page 16, line 26, is being amended as follows:

To a flask having an inner volume of 200 ml, made of glass and equipped with a stirring device, a thermometer and a reflux condenser were charged 10.0 g (41.2 mmol) of 2-methyltetrahydropyranyl-4-methanesulfonate with a purity of 80% and synthesized in the same manner as in the following mentioned Example 16, 20 ml (412 mmol) of hydrazine monohydrate and 20 ml of ethanol, and the mixture was reacted at 75°C for 3 hours under nitrogen atmosphere with stirring. After completion of the reaction, the reaction mixture was cooled to room temperature, 9.45 g (49 mmol) of 28% by weight sodium methoxide-methanol solution was added to the mixture, and the resulting mixture was concentrated under reduced pressure. After adding 200 ml of toluene to the concentrate, the mixture was filtered, and the filtrate was again concentrated under reduced pressure. The concentrate was cooled to 0°C, 50 ml of methanol and 5.0 ml (60 mmol) of 12 mol/l hydrochloric acid were added to the concentrate, and then, the

mixture was concentrated under reduced pressure. The concentrate was recrystallized from ethanol and toluene to obtain 3.82 g (Isolation yield: ~~61%~~ 55%) of 4-hydrazino-2-methyltetrahydropyran hydrochloride with a purity of 99% (areal percentage by gas chromatography) as colorless crystals.

The paragraph beginning on page 17, line 22, is being amended as follows:

To a flask having an inner volume of 500 ml, made of glass and equipped with a stirring device, a thermometer and a reflux condenser were charged 65.3 g (392 mmol) of 4-hydrazino-2-methyltetrahydropyran hydrochloride with a purity of 100% and synthesized in the same manner as in the above-mentioned (1), 18.0 g of developed Raney nickel, 120 ml of ethanol, 120 ml of water and 40 ml (320 mmol) of 8 ~~mmol/l~~ mol/l aqueous sodium hydroxide solution, and the mixture was reacted at 75°C for 24 hours under hydrogen atmosphere. After completion of the reaction, the reaction mixture was cooled to room temperature and filtered, and the filtrate was concentrated under reduced pressure. Then, 200 ml of n-butyl alcohol and 50 ml (600 mmol) of 12 mol/l hydrochloric acid were added to the concentrate, the resulting mixture was concentrated under reduced pressure to obtain 38.2 g (Isolation yield: 63%) of 4-amino-2-methyltetrahydropyran hydrochloride with a purity of 98% (areal percentage by gas chromatography) as white powder.

The paragraph beginning on page 18, line 4, is being amended as follows:

Physical properties of the 4-amino-2-methyltetrahydropyran hydrochloride are as follows.

CI-MS (m/e); ~~117~~ 116 (M+1-HCl)

^{1}H-NMR (DMSO-d_6, δ (ppm)); 1.09 (3H, d, J=6.0Hz), 1.48 to 1.84 (4H, m), 3.47 to 3.93 (4H, m), 8.44 (3H, brs)

The paragraph beginning on page 18, line 11, is being amended as follows:

To a flask having an inner volume of 100 ml, made of glass and equipped with a stirring device, a thermometer and a reflux condenser were charged 1.0 g (~~6.02~~ 6.00 mmol) of [[4-]] ~~hydrazinotetrahydropyran~~ 4-hydrazino-2-methyltetrahydropyran hydrochloride with a purity of 100% and synthesized in the same manner as in Example 4(1), 100 mg of developed Raney nickel, 3.0 ml (6.0 mmol) of 2 mol/l an aqueous sodium hydroxide solution and 2.5 ml of ethanol, and the mixture was reacted at 75°C for 2 hours under hydrogen atmosphere. After completion of the reaction, the reaction mixture was cooled to room temperature and filtered, and when the filtrate was analyzed (internal standard method) by gas chromatography, 559 mg (Reaction yield: ~~61%~~ 81%) of 4-amino-2-methyltetrahydropyran was found to be formed.

The paragraph beginning on page 18, line 27, is being amended as follows:

To a flask having an inner volume of ~~100~~ 300 ml, made of glass and equipped with a stirring device, a thermometer and a reflux condenser were charged 30.0 g (~~158.7~~ 194.6 mmol) of 4-hydrazinotetrahydropyran hydrochloride with a purity of 99% and synthesized in the same manner as in ~~Example 2(1)~~ Reference example 2, 3.0 g (0.70 mmol calculated as palladium atom) of 5% by weight palladium/carbon (50% wet product) and 150 ml of ethanol, and the mixture was reacted at 75°C for 24 hours under hydrogen atmosphere (0.1 MPa. After

completion of the reaction, the reaction mixture was cooled to room temperature and filtered, and the filtrate was concentrated under reduced pressure. When the concentrate was analyzed (internal standard method) by gas chromatography, 15.9 g (Reaction yield: ~~72%~~ 81%) of 4-aminotetrahydropyran was found to be formed. Then, 200 ml of n-butyl alcohol and 17.4 g (~~166.8~~ 174 mmol) of 12 mol/l hydrochloric acid were added to the concentrate, and the mixture was concentrated under reduced pressure to obtain 14.3 g (Isolation yield: ~~65%~~ 52%) of 4-aminotetrahydropyran hydrochloride with a purity of 98% (areal percentage by gas chromatography) as white crystals.

The paragraph beginning on page 19, line 11, is being amended as follows:

Physical properties of the 4-aminotetrahydropyran hydrochloride were the same as those in ~~Example 2(2)~~ Example 2.

The paragraph beginning on page 19, line 15, is being amended as follows:

To a flask having an inner volume of ~~100~~ 300 ml, made of glass and equipped with a stirring device, a thermometer and a reflux condenser were charged 30.0 g (~~158.7~~ 194.6 mmol) of 4-hydrazinotetrahydropyran hydrochloride with a purity of 99% and synthesized in the same manner as in ~~Example 2(1)~~ Reference example 2, 1.5 g (0.70 mmol calculated as palladium atom) of 10% by weight palladium/carbon (50% wet product) and 150 ml of ethanol, and the mixture was reacted at 75°C for 24 hours under hydrogen atmosphere (0.1 MPa). After completion of the reaction, the reaction mixture was cooled to room temperature and filtered, and the filtrate was concentrated under reduced pressure. When the concentrate was analyzed

(internal standard method) by gas chromatography, 15.9 g (Reaction yield: ~~72%~~ 81%) of 4-aminotetrahydropyran was found to be formed. Then, 200 ml of n-butyl alcohol and 27.6 g (160.0 mmol) of 47% by weight hydrobromic acid were added to the concentrate, and the resulting mixture was concentrated under reduced pressure to obtain 17.4 g (Isolation yield: ~~60%~~ 49%) of 4-aminotetrahydropyran hydrobromide with a purity of 99% (areal percentage by gas chromatography) as white crystals.

The paragraph beginning on page 20, line 9, is being amended as follows:

To a flask having an inner volume of 100 ml, made of glass and equipped with a stirring device, a thermometer and a reflux condenser were charged 1.0 g (~~55.6~~ 6.49 mmol) of 4-hydrazinotetrahydropyran hydrochloride with a purity of 99% and synthesized in the same manner as in ~~Example 2(1)~~ Reference example 2, 3.0 g (0.38 mmol calculated as platinum atom) of 5% by weight platinum/carbon (50% wet product) and 5 ml of ethanol, and the mixture was reacted at 75°C for 72 hours under hydrogen atmosphere (0.1 MPa). After completion of the reaction, the reaction mixture was cooled to room temperature and filtered, and the filtrate was concentrated under reduced pressure. when the concentrate was analyzed (internal standard method) by gas chromatography, 0.48 g (Reaction yield: ~~53%~~ 73%) of 4-aminotetrahydropyran was found to be formed.

The paragraph beginning on page 20, line 26, is being amended as follows:

To a flask having an inner volume of 100 ml, made of glass and equipped with a stirring device, a thermometer and a reflux condenser were charged 3.0 g (~~19.6~~ 19.5 mmol) of 4-

hydrazinotetrahydropyran hydrochloride with a purity of 99% and synthesized in the same manner as in ~~Example 2(1)~~ Reference example 2, 600 mg (0.08 mmol calculated as platinum atom) of 5% by weight platinum/carbon (50% wet product), 5 ml of ethanol and 6 ml of water, and the mixture was reacted at 75°C for 3 hours under hydrogen atmosphere (1.0 MPa). After completion of the reaction, the reaction mixture was cooled to room temperature and filtered, and the filtrate was concentrated under reduced pressure. When the concentrate was analyzed (internal standard method) by gas chromatography, 1.4 g (Reaction yield: ~~54%~~ 71%) of 4-aminotetrahydropyran was found to be formed.

The paragraph beginning on page 21, line 7, is being amended as follows:

To a flask having an inner volume of 100 ml, made of glass and equipped with a stirring device, a thermometer and a reflux condenser were charged 1.0 g (~~55.6~~ 5.94 mmol) of 4-hydrazino-2-methyltetrahydropyran hydrochloride with a purity of 99% and synthesized in the same manner as in Example 4(1), 100 mg (0.02 mmol calculated as palladium atom) of 5% by weight palladium/carbon (50% wet product), 2.5 ml of ethanol and 2.5 ml of water, and the mixture was reacted at 75°C for 24 hours under hydrogen atmosphere (0.1 MPa). After completion of the reaction, the reaction mixture was cooled to room temperature and filtered, and the filtrate was concentrated under reduced pressure. When the concentrate was analyzed (internal standard method) by gas chromatography, 0.59 g (Reaction yield: ~~64%~~ 86%) of 4-amino-2-methyltetrahydropyran was found to be formed.

The paragraph beginning on page 21, line 24, is being amended as follows:

To a flask having an inner volume of 100 ml, made of glass and equipped with a stirring device, a thermometer and a reflux condenser were charged 1.0 g (~~5.55~~ 6.49 mmol) of 4-hydrazinotetrahydropyran hydrochloride with a purity of 99% and synthesized in the same manner as in ~~Example 2(1)~~ Reference example 2, 6.2 ml of ethanol, ~~1.2 ml (1.20 mmol)~~ 12 ml (12 mmol) of 1 mol/l aqueous sodium hydroxide solution and 1.5 g (10 mmol) of copper (I) oxide, and the mixture was reacted at 65°C for 1 hour. After completion of the reaction, the reaction mixture was cooled to room temperature and filtered, and the filtrate was concentrated under reduced pressure. When the concentrate was analyzed (internal standard method) by gas chromatography, 0.47 g (Reaction yield: ~~50%~~ 72%) of 4-aminotetrahydropyran was found to be formed. Then, 5 ml of n-butyl alcohol and ~~10 ml~~ 1 ml (12.0 mmol) of 12 mol/l hydrochloric acid were added to the concentrate, and the resulting mixture was concentrated under reduced pressure to obtain 0.42 g (Isolation yield: ~~45%~~ 46%) of 4-aminotetrahydropyran hydrochloride with a purity of 98% (areal percentage by gas chromatography) as white crystals.

The paragraph beginning on page 22, line 8, is being amended as follows:

Physical properties of the 4-aminotetrahydropyran hydrochloride were the same as those in ~~Example 2(2)~~ Example 2.

The paragraph beginning on page 22, line 12, is being amended as follows:

To a flask having an inner volume of 20 L, made of glass and equipped with a stirring device, a thermometer, a dropping funnel and a reflux condenser were charged 5873 g (115 mol)

of 98% aqueous hydrazine solution and 2072 ml of ethanol, and the mixture was heated to 75°C with stirring. Then, a solution in which 2136 g (11.5 mol) of tetrahydropyranyl-4-methanesulfonate with a purity of ~~70%~~ 97% had been dissolved in 2072 ml of ethanol was gradually added dropwise to the mixture, and the mixture was reacted at the same temperature for 4 hours with stirring. After completion of the reaction, the mixture was cooled to room temperature to obtain a reaction mixture comprising 4-hydrazinotetrahydropyran as a main product.

The paragraph beginning on page 23, line 2, is being amended as follows:

To a flask having an inner volume of 20 L, made of glass and equipped with a stirring device, a thermometer, a dropping funnel, a reflux condenser and a distillation device under reduced pressure were charged the above reaction solution, 2072 ml (10.9 mol) of tetraethylenepentamine and 4100 ml of n-butyl alcohol, and the mixture was stirred at 80°C for 2 hours under reduced pressure. Then, 4-aminotetrahydropyran and n-butyl alcohol were removed by azeotropic distillation under reduced pressure. Thereafter, 4100 ml of n-butyl alcohol was added again, 4-aminotetrahydropyran and n-butyl alcohol were removed by azeotropic distillation under reduced pressure. This operation was repeated to three times to obtain 15000 ml of a distilled solution in total. To the distilled solution was added 575 ml (6.90 mol) of conc. hydrochloric acid, and then, the mixture was concentrated under reduced pressure. To the concentrate was again added 8200 ml of n-butyl alcohol, and water and n-butyl alcohol were removed by azeotropic distillation under reduced pressure. Then, 7460 ml of n-butyl alcohol and 3730 ml of ethanol were added to the residue, and the resulting mixture was once heated up to 115°C and stirred, then, it was gradually cooled to -5°C and stirred for 30 minutes. After the

filtration, the filtrate was washed with cooled toluene and dried to obtain 788.9 g (Isolation yield based on tetrahydropyranyl-4-methanesulfonate: ~~50%~~ 49%) of 4-aminotetrahydropyran hydrochloride with a purity of 99% (internal standard method by gas chromatography) as white needle-like crystals.

The paragraph beginning on page 23, line 30, is being amended as follows:

Physical properties of the 4-aminotetrahydropyran hydrochloride were the same as those in Example ~~2(2)~~ 2.

The paragraph beginning on page 23, line 35, is being amended as follows:

To a flask having an inner volume of 500 ml, made of glass and equipped with a stirring device, a thermometer, a dropping funnel and a reflux condenser were charged 97 ml (1.99 mol) of hydrazine monohydrate and 33 ml of ethanol, and the mixture was heated up to 75°C with stirring. Then, a solution in which 30.0 g (~~0.124~~ 0.131 mol) of 2-methyltetrahydropyranyl-4-methanesulfonate with a purity of 85% and dissolved in 33 ml of ethanol was gradually added to the mixture dropwise, and the mixture was reacted at the same temperature for 8 hours with stirring. After completion of the reaction, the mixture was cooled up to room temperature to obtain a reaction solution containing 4-hydrazino-2-methyltetrahydropyran as a main product.

The paragraph beginning on page 24, line 27, is being amended as follows:

To the reaction solution were added 30 ml (158.2 mmol) of pentaethylenehexamine and 30 ml of n-butyl alcohol, and the mixture was stirred at 80°C for 2 hours under reduced pressure.

Then, ~~4-aminotetrahydropyran~~ 4-amino-2-methyltetrahydropyran and n-butyl alcohol were removed by azeotropic distillation under reduced pressure. Thereafter, the distilled solution was cooled up to 0°C, 15 ml (180 mmol) of 12 mol/l hydrochloric acid was added thereto, and the resulting mixture was concentrated under reduced pressure to obtain 10.2 g (Isolation yield based on ~~2-methylaminotetrahydropyranyl-4-methanesulfonate~~ 2-methyltetrahydropyranyl-4-methanesulfonate: 51%) of 4-amino-2-methyltetrahydropyran hydrochloride with a purity of 99% (areal percentage by gas chromatography) as colorless crystals.

The paragraph beginning on page 25, line 9, is being amended as follows:

To a flask having an inner volume of 500 ml, made of glass and equipped with a stirring device, a thermometer, a dropping funnel and a reflux condenser were charged 97 ml (1.99 mol) of hydrazine monohydrate and 33 ml of ethanol, and the mixture was heated up to 75°C with stirring. Then, a solution in which 30.0 g (~~0.124~~ 0.141 mol) of ~~2-tetrahydropyranyl-4-methanesulfonate~~ tetrahydropyranyl-4-methanesulfonate with a purity of 85% had been dissolved in 33 ml of ethanol was gradually added dropwise thereto, and the mixture was reacted at the same temperature for 8 hours with stirring. After completion of the reaction, the mixture was cooled up to room temperature to obtain a reaction solution containing 4-hydrazinotetrahydropyran as a main product.

The paragraph beginning on page 26, line 1, is being amended as follows:

To the reaction solution were added 30 ml (215.2 mmol) of triethylamine and 30 ml of n-butyl alcohol, the mixture was stirred at room temperature for 1 hour, and precipitated crystals

were filtered off. Then, the filtrate was concentrated under reduced pressure to obtain 15.2 g (Isolation yield based on tetrahydropyranyl-4-methanesulfonate: ~~58%~~ 52%) of 4-aminotetrahydropyran methanesulfonate with a purity of 96% (internal standard method by gas chromatography) as colorless crystals.

The paragraph beginning on page 26, line 10, is being amended as follows:

Physical properties of the 4-aminotetrahydropyran methanesulfonate were as follows.

Melting point; 204 to 208°C

CI-MS (m/e); 102 ~~(M+1)~~ (M+1 – CH_3SO_3H)

^{1}H-NMR (DMSO-d_6, δ (ppm)); 1.45 to 1.60 (2H, m), 1.80 to 1.91 (2H, m), 2.38 (3H, s), 3.15 to 3.36 (3H, m), 3.84 to 3.89 (2H, m), 7.99 (3H, brs)

The paragraph beginning on page 26, line 19, is being amended as follows:

To a flask having an inner volume of 100 ml, made of glass and equipped with a stirring device, a thermometer, a dropping funnel and a reflux condenser were charged 19 ml (0.39 mol) of hydrazine monohydrate and 19 ml of ethanol, and the mixture was heated up to 75°C with stirring. Then, a solution in which 10.0 g (~~0.124~~ 0.039 mol) of tetrahydropyranyl-4-p-toluenesulfonate with a purity of 100% had been dissolved in 19 ml of ethanol was gradually added dropwise to the mixture, and the mixture was reacted at the same temperature for 8 hours with stirring. After completion of the reaction, the mixture was cooled up to room temperature to obtain a reaction solution containing 4-hydrazinotetrahydropyran as a main product.

The paragraph beginning on page 26, line 32, is being amended as follows:

Then, to a flask having an inner volume of 100 ml, made of glass and equipped with a stirring device, a thermometer, a dropping funnel, a reflux condenser and a distillation device under reduced pressure were charged 2.6 g (28.8 mmol calculated as nickel atom) of 65% by weight developed Raney nickel, 19 ml of ethanol and 19 ml of water, and the mixture was heated up to 65°C with stirring. Then, the above reaction solution was gradually added dropwise thereto, and the resulting mixture was reacted at 65°C for 2 hours with stirring. After completion of the reaction, the reaction mixture was cooled to room temperature, Raney nickel was filtered off, and when the filtrate was analyzed (internal standard method) by gas chromatography, 1.2 g (Isolation yield based on tetrahydropyranyl-4-p-toluenesulfonate: ~~53%~~ 30%) of 4-aminotetrahydropyran was found to be formed.